



PATENT
8037-1006

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#8
Appeal Brief (3)
Inclined
11/30/03

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of:

Eishi MATSUDA

Conf.: 1008

Appl. No.: 09/975,054

Appeal No. _____
(GROUP 2816)

Filed: October 12, 2001

Examiner: Terry Cunningham

COMPACT DC STABILIZED POWER
SUPPLY CAPABLE OF SUPPRESSING
FLUCTUATION OF OUTPUT VOLTAGE IN
SPITE OF ABRUPT FLUCTUATION OF
LOAD CURRENT

APPEAL BRIEF

MAY IT PLEASE YOUR HONORS:

1. Real Party in Interest

The real party in interest in this appeal is the assignee, NEC Corporation of Tokyo, Japan.

2. Related Appeals and Interferences

None.

3. Status of Claims

Claims 1-10 are pending, from whose final rejection this appeal is taken. Independent claims 1, 4, and 7 were amended in March 10, 2003. The remaining claims are all original. The claims are listed in the attached Appendix.

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4. Status of Amendments

No amendments were filed subsequent to the final rejection.

5. Summary of Invention

The invention is a direct current (DC) stabilized power supply with a DC-DC converter circuit for converting a DC input voltage to a predetermined DC output voltage (Background of the Invention). In the DC stabilized power supply of the present invention, transient fluctuations of output voltage are suppressed (Summary of the Invention, lines 5-9).

The three configurations of this power supply (10), illustrated in Figures 1-3, each include a DC-DC voltage converter circuit (11) connected to i) an output node passing through to the power supply output, ii) a current absorbing branch comprising a first differentiating circuit (12) and a current absorbing circuit (13), and iii) a current injecting branch comprising a second differentiating circuit (14) and a current injecting circuit (15).

The DC-DC voltage converter circuit converts a DC input power supply voltage into a predetermined DC output voltage (Specification page 8, lines 20-23). The converter circuit itself is conventional and responds by following fluctuations of the load current (Specification page 1, lines 10-20).

To deal with the load current fluctuations and thereby stabilize output voltage, the inventors have located intermediate

the converter circuit output node and power supply output the current absorbing branch and the current injecting branch (Figures 1-3).

A first embodiment of the invention (claim 1) addresses suppression of transient rises of converter circuit output voltage due to abrupt decreases of load current (Specification page 3, line 12 through Specification page 4, line 7; and beginning at Specification page 8, line 10).

The converter circuit follows an abrupt decrease of load current by an abrupt rise in output voltage. The first differentiating circuit output voltage responds to fluctuations of the converter circuit output voltage whereby this abrupt rise in converter circuit output voltage increases the first differentiating circuit output voltage which in turn causes the current absorbing circuit to absorb current and suppress the transient rise of output voltage.

A second embodiment of the invention (claim 4) addresses suppression of transient drops of converter circuit output voltage due to abrupt increases of load current (Specification page 4, line 8 through Specification page 5, line 3; and beginning at Specification page 9, line 15).

The converter circuit follows an abrupt increase of load current by an abrupt drop in output voltage. This abrupt drop in converter circuit output voltage decreases the second

differentiating circuit output voltage, in turn causing the current injecting circuit to inject current and suppress the transient drop of output voltage.

A third embodiment (claim 7) utilizes both the current absorbing branch and the current injecting branch to suppress transient fluctuations of output voltage.

Figure 1 illustrates these embodiments.

Figure 2 illustrates the use of control signals from the converter circuit to the differentiating circuits to stop operation of the differentiating circuits during starting or stopping of the power supply (Specification page 12, lines 3-8).

Figure 3 illustrates the use of control signals from the converter circuit to the current absorbing and injection circuits to stop operation of the differentiating circuits during starting or stopping of the power supply (Specification page 14, lines 3-8).

6. Issues

A first issue on appeal is whether claims 1-10 were properly rejected as under §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

A second issue on appeal is whether claims 1-10 were properly rejected under §102(b) as anticipated by DOLUCA et al. 4,769,784 ("DOLUCA").

7. Grouping of Claims

As to the first issue on appeal, all the claims are grouped together; however, they do not stand or fall together as i) claim 7 includes recitations from both claims 1 and 4, and ii) claims 1 and 4 includes features not recited in the other claim (but recited in claim 7). Thus, the claims are stand or fall on claim 7

As to the second issue on appeal, all the claims are grouped together; however, they do not stand or fall together as i) claim 7 includes recitations from both claims 1 and 4, and ii) claims 1 and 4 includes features not recited in the other claim (but recited in claim 7). Thus, the claims are stand or fall on claim 7.

8. Arguments

Arguments Concerning the First Issue

The first issue on appeal is whether the claims were properly rejected as under §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

This rejection is improper because the specification and drawing Figures 1-3 do describe the claimed subject matter so as to enable one skilled in the art to make and/or use the invention.

Although the particulars for each circuit element are not detailed, these elements are conventional and the invention lies in the combination thereof. The elements used in the inventive circuit, their operation, and their operative connections are disclosed so as to enable one of skill in the art to make and use the invention without undue experimentation. That is all that is required by §112, first paragraph, as the invention is not in the circuitry of the individual elements but in the recited combination producing the inventive DC stabilized power supply.

Although not on all fours, in *Ex parte Butler*, 217 USPQ 290 (Bd. App. 1982) addresses this issue. In that case, the Examiner rejected §112, 6th paragraph claims as not enabled where the specification did not contain a description of the structure performing the function required by the claims. Appellant urged that there was no requirement for structure in the first or any other paragraph of 35 USC 112. Appellant also urged that the only requirement of the description is that it enables one having ordinary skill in the art.

The opinion agrees with appellant (*Id.* at 291), "[w]e agree with appellant that 35 USC 112 contains no requirement for a structural disclosure" and "[w]e disagree with the fundamental position of the examiner that the disclosure is not enabling simply because there is no disclosure of the structure necessary to carry out the means recited in the apparatus claims." *Id.* at 292.

Claim 7 recites a DC stabilized power supply, using seven recitations concerning five elements and two connection arrangements, listed below and including element identification numerals that correspond to the drawing figures:

- 1) a DC-DC voltage converter circuit (11) for converting an inputted DC power supply voltage into a predetermined DC voltage supplied on an output of the converter circuit;
- 2) a first differentiating circuit (12) for differentiating variations in an output voltage of said converter circuit;
- 3) a current absorbing circuit (13) driven by an output voltage of said first differentiating circuit;
- 4) a second differentiating circuit (14) for differentiating variations in the output voltage of said converter circuit; and

5) an current injecting circuit (15) driven by an output voltage of said second differentiating circuit,

6) an output of the current injecting circuit being connected to the output of the DC-DC voltage converter circuit, and

7) an output of the current absorbing circuit being connected to the output of the voltage converter circuit.

The structural relationship between the five recited elements is clear both in the claim and as illustrated in Figures 1-3. The Examiner is understood to not dispute this.

The essence of the rejection, however, is not clear.

Initially, it appears that the Examiner feels that the level of detail disclosed for each of the recited elements is insufficient; that is, whether the functional blocks, used to illustrate the invention, are adequate disclosure to enable one of skill to make and/or use the invention. However, the Examiner also refers to undue experimentation.

In any event, the specification provides disclosure that meets the requirement of §112, first paragraph. The specification complies with the plain language of §112, first paragraph which specifically requires that specification be *concise and written to the person skilled in the art to which the invention pertains.* In view of this, the specification need not disclose subject matter that is well known in the art.

MPEP §2164.01, in discussing the test of enablement, recognizes this. Indeed, here the MPEP states that "[a] patent need not teach and preferably omits, what is well known in the art" citing to In re Buchner, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986), cert. denied, 480 U.S. 947 (1987); and Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co., 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984).

In the final Official Action of April 4, 2003, the Examiner finally rejects the claims under §112, first paragraph. In the last full paragraph on page 2, the Examiner's line of reasoning is: 1) the specification only discloses blank boxes for each of the elements 11-15; 2) blank boxes are acceptable for elements having broad text meanings known in the art to have well known specific construction; 3) as elements 11-15 do not have well known specific construction, the specification is not enabled.

The basis of rejection fails because: 1) the specification discloses more than blank boxes for each of the elements, and 2) the recited elements have known specific constructions.

Indeed, see page 3, lines 2-3 of the Official Action acknowledging that the phrase "DC-DC converter" is well known and

indicating that the rejection is based on there not being specifics as to what the converter is intended to comprise. The Official Action next acknowledges that there are a "massive amount of elements in the art, all having significantly differing structure, that are known as 'DC-DC converters'". The Examiner follows this statement with the conclusion that "[w]ithout more specifics concerning exactly what this element is or what such is intended to do, it is not seen that one skilled in the art can make and use the invention without 'undue experimentation.'"

The Examiner thus acknowledges that the recited elements are known to those skilled in the art, but that there would be undue experimentation to select from those known choices in the art to make and/or use the invention.

This basis of rejection also fails because; although there may be some experimentation require to make and/or use the invention, the test of enablement is not whether any experimentation is necessary, but whether, if experimentation is necessary, it is undue. *In re Angstadt*, 537 F.2d 498, 504, 190 USPQ 214, 219 (CCPA 1976). The specification provides adequate disclosure to avoid undue experimentation.

In regard to the specification disclosing no more than blank boxes, the Examiner (page 2, last full paragraph) refers to the converter circuit 11 being only described as converting a DC voltage to a DC voltage; there being no disclosure concerning the

type or value of the converter output voltage; and there being no specifics concerning how to make and use the boxes shown in the figures.

This is not the case.

The specification (beginning with the second full paragraph of page 1) discusses DC stabilized power supplies having DC-DC converter operations and prior-art problems (limited response speed). An example of a DC stabilized power supply is identified as being disclosed by Japanese Patent Publication No. Hei 04-359675. The operation of this power supply follows in the first full paragraph of Specification page 2.

Another DC stabilized power supply is identified as being disclosed by Japanese Patent Publication No. Hei 07-115770.

These show that those skilled are aware of the general construction and operation of such circuits.

The general operation of the invention, including how the inventive power supply deals with load current fluctuations, is covered in the Summary of the Invention section of the specification. E.g. the first paragraph of Specification page 4, "the current absorbing circuit absorbs current incident to an output of the converter circuit by operating based on the output voltage of the first differentiating circuit. Accordingly, transient rises of the output voltage of the converter circuit

due to abrupt decreases of the load current in excess of follow-up operations of the converter circuit can be suppressed."

Similar passages are present for the other invention elements. E.g., concerning the current injecting branch operation (third paragraph of Specification page 4), "the output voltage of the converter circuit drops transiently due to an abrupt increase of load current of load connected to an output of the DC stabilized power supply. Accordingly, in response to the fluctuations of the output voltage of the second differentiating circuit becomes greater as the fluctuations of the output voltage become larger."

In the next paragraph spanning Specification pages 4-5, the response by the current injecting circuit is described: "the current injecting circuit injects current into the output of the converter circuit by operating based on the output voltage of the second differentiating circuit."

Those skilled in the art are given an understanding of the operational requirements of the invention by such passages. These disclosures enable one of skill to make and use the invention, the details of the construction being application specific and naturally requiring adaptation as to specific operational requirements.

In the Detailed Description of the Preferred Embodiments section, beginning on Specification page 8, more

detail is provided. The level of detail is sufficient to avoid undue experimentation.

See Specification page 8, beginning at line 23, describes the current absorbing branch, disclosing the operational relationship of the DC-DC voltage converter circuit (11), the first differentiating circuit (12) for differentiating variations in an output voltage of said converter circuit, and the current absorbing circuit (13) driven by an output voltage of said first differentiating circuit.

As disclosed, the converter output is input to the first differentiating circuit, which differentiating circuit outputs a voltage corresponding to fluctuations of the converter circuit output. It is specifically identified that as the fluctuations become larger, the change of the output voltage of the first differentiating circuit becomes greater (sentence spanning Specification pages 8-9).

In the first full paragraph of Specification page 9, it is disclosed that the positive output voltage of the first differentiating circuit drives the current absorbing circuit, and in this way the current absorbing circuit absorbs current based on the output of the converter circuit.

At line 7, the specification moves to disclosing the current injecting branch comprising second differentiating

circuit (12), driven again by converter circuit (11) and driving current injection circuit (15).

As with the first differentiating circuit of the current absorbing branch, the second differentiating circuit outputs a voltage corresponding to fluctuations of the converter circuit output. As the fluctuations become larger, the change of the second differentiating circuit becomes greater.

The current injecting circuit is driven by a negative output of the second differentiating circuit so that the current thereby injects current into the output of the converter circuit (lines 15-18).

The operation of the inventive power supply is discussed beginning on Specification page 9, line 19 and continues through page 11, line 19.

It is acknowledged that the drawing figures use blocks to illustrate the various circuits; however, these blocks disclose taken in combination with the specification and the skill in the art, enable one of skill in the art to make and/or use the invention without undue experimentation. This satisfies §112, first paragraph.

Lastly, the Examiner takes exception to claim 1 reciting only the current injecting branch and claim 4 reciting only the current absorbing branch, as lacking elements critical or essential to the practice of the invention. The Examiner

feels that only claim 7, which recites both the current injecting and the current absorbing branches includes all elements necessary to the practice of the invention.

Claims 1 and 4 are proper as the recited combinations each concern an arrangement to address one side of the abrupt current increase/decrease problem. Granted, claim 7 addresses both sides the abrupt current increase/decrease problem, but each independent claim recites an embodiment that presents an improvement over the prior art.

Thus, as the specification is fully enabling, the enablement rejection can not be maintained.

Arguments Concerning the Second Issue

The second issue on appeal is whether claims 1-10 were properly rejected under as anticipated by DOLUCA.

The rejection is improper as DOLUCA does not disclose each recited feature of the claims.

The Examiner reads the claim 7 recitations onto DOLUCA Figures 2-3 as follows:

"A DC-DC voltage converter circuit for converting an inputted DC power supply voltage into a predetermined DC voltage supplied on an output of the converter circuit" is read onto Figure 3.

"A first differentiating circuit for differentiating variations in an output voltage of said converter circuit" is read onto elements 39 and 43 of Figure 2.

"A current absorbing circuit driven by an output voltage of said first differentiating circuit" is read on element 45.

"A second differentiating circuit for differentiating variations in the output voltage of said converter circuit" is read on elements 31 and 35.

"An current injecting circuit driven by an output voltage of said second differentiating circuit" is read on element 37.

The recitations of "an output of the current injecting circuit being connected to the output of the DC-DC voltage converter circuit, and an output of the current absorbing circuit being connected to the output of the voltage converter circuit" are said to be disclosed by Figure 3.

DOLUCA does not anticipate.

In general, DOLUCA discloses a capacitor-plate bias circuit (Figure 2) producing a voltage on the capacitor plate node (capacitor-plate line 19 of Figure 2 represents all the capacitor-plate nodes of Figure 1 as per column 3, lines 58-61). The DOLUCA circuit includes a reference-voltage source (21, 23 of Figure 3) and a feedback control circuit for enabling either a charge pump

or a charge bleeder to regulate the capacitor-plate voltage at a level above the circuit supply voltage (V_{BG} above V_{CC}). See the Abstract.

Thus, the DOLUCA circuit does not convert an inputted DC power supply voltage into a supplied predetermined DC voltage, i.e., there is no conversion of DC supply voltage to a predetermined DC voltage at line 19 of Figure 2. Rather, the DOLUCA tracks the circuit supply voltage (V_{CC}) and maintains a differential voltage (V_{BG}) above V_{CC} at line 19 of Figure 2. Also see column 3, lines 38-45.

Thus, DOLUCA Figures 2-3 do not disclose the recited DC-DC voltage converter circuit for converting an inputted DC power supply voltage into a predetermined DC voltage supplied on an output of the converter circuit.

As to the specific recitations, the Examiner reads "a DC-DC voltage converter circuit for converting an inputted DC power supply voltage into a predetermined DC voltage supplied on an output of the converter circuit" onto Figure 3.

As per the "BRIEF DESCRIPTION OF THE DRAWING" section, Figure 3 is a schematic representation of a charge pump 37. See column 5, beginning at line 19, "[t]urning now to FIGS. 3 and 4, a circuit realization of charge pump 37 is shown ..."

Since Figure 3 details charge pump 37 of Figure 2, Figure 3 can not anticipate the DC-DC converter circuit recitation.

Note that the Examiner has also offered charge pump 37 as anticipating the recited current injection circuit. Therefore, even if charge pump 37 was considered the DC-DC converter circuit, then there is no disclosure of the recited current injection circuit.

Again, even if charge pump 37 is seen as being a DC-DC converter circuit of some type, note that requirement that the output voltage of the DC-DC converter circuit be differentiated by both the first and second differentiating circuits. I.e., "a first differentiating circuit **for differentiating variations in an output voltage of said converter circuit**" and "a second differentiating circuit **for differentiating variations in the output voltage of said converter circuit.**" The Examiner has read the first and second differentiating circuit recitations onto elements 39/43 and 31/35.

39/43 and 31/35 do not differentiate variations in the output voltage of charge pump 37. Indeed, see that charge pump 37 is driven by the 31/35 combination.

Turning to column 4, beginning at line 4, one sees that 39/43 and 31/35 are voltage divider/comparator pairs. The negative terminal of the comparators sense the V_{BG} plus $V_{CC}/2$

reference voltage (Vref) from 21/23. The positive terminals of the comparators see a fraction of the voltage on line 19 (as per lines 23-29). The comparators compare the fractional voltage of line 19 with Vref and turn on either the charge pump 37 or the charge bleeder 45.

The 39/43 and 31/35 pairs do not, however, differentiate variations of an output voltage of charge pump 37 (Figure 3) as offered by the Examiner.

Also see that specific connection relationship recited by "an output of the current injecting circuit being connected to the output of the DC-DC voltage converter circuit, and

"an output of the current absorbing circuit being connected to the output of the [DC-DC] voltage converter circuit."

This requires that the outputs of the current injecting circuit, the current absorbing circuit, and the DC-DC voltage converter be commonly connected.

DOLUCA does not make this disclosure.

If charge pump 37 is the current injecting circuit, and charge bleeder 45 is the current absorbing circuit, there is no connection between these circuit outputs and any DC-DC voltage converter circuit.

Thus, as DOLUCA does not disclose each recited feature of the invention, the anticipation rejection fails.

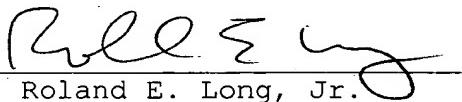
9. Conclusion

In view of foregoing, it follows that the rejection of claims 1-10 under §112, first paragraph and under §102 are both improper and should be reversed. Reversal of these rejections is accordingly respectfully solicited.

Respectfully submitted,

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November 14, 2003

10. Appendix

The claims on appeal:

1. (previously presented) A DC stabilized power supply for use in converting an inputted DC power supply voltage into a predetermined DC voltage, comprising:

a DC-DC voltage converter circuit for converting an inputted DC power supply voltage into a predetermined DC voltage supplied on an output of the converter circuit;

a first differentiating circuit for differentiating variations in an output voltage of said converter circuit; and

a current absorbing circuit driven by an output voltage of said first differentiating circuit,

an output of the current absorbing circuit being connected to the output of the DC-DC voltage converter circuit.

2. (original) A DC stabilized power supply as claimed in claims 1, wherein said converter circuit outputs a control signal to said first differentiating circuit or said second differentiating circuit to stop an operation of said first differentiating circuit or said second differentiating circuit, when said DC stabilized power supply is starting or stopping.

3. (original) A DC stabilized power supply as claimed in claim 1, wherein said converter circuit outputs a control signal to said current absorbing circuit to stop an operation of

said current absorbing circuit, when said DC stabilized power supply is starting or stopping.

4.. (previously presented) A DC stabilized power supply for use in converting an inputted DC power supply voltage into a predetermined DC voltage, comprising:

a DC-DC voltage converter circuit for converting an inputted DC power supply voltage into a predetermined DC voltage supplied on an output of the converter circuit;

a second differentiating circuit for differentiating variations in an output voltage of said converter circuit; and

a current injecting circuit driven by an output voltage of said second differentiating circuit,

an output of the current injecting circuit being connected to the output of the DC-DC voltage converter circuit.

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5. (original) A DC stabilized power supply as claimed

in claims 4, wherein said converter circuit outputs a control signal to said first differentiating circuit or said second differentiating circuit to stop an operation of said first differentiating circuit or said second differentiating circuit, when said DC stabilized power supply is starting or stopping.

6. (original) A DC stabilized power supply as claimed in claim 4, wherein said converter circuit outputs a control signal to said current injecting circuit to stop an operation of

said current injecting circuit, when said DC stabilized power supply is starting or stopping.

7. (previously presented) A DC stabilized power supply for use in converting an inputted DC power supply voltage into a predetermined DC voltage, comprising:

a DC-DC voltage converter circuit for converting an inputted DC power supply voltage into a predetermined DC voltage supplied on an output of the converter circuit;

a first differentiating circuit for differentiating variations in an output voltage of said converter circuit;

a current absorbing circuit driven by an output voltage of said first differentiating circuit;

a second differentiating circuit for differentiating variations in the output voltage of said converter circuit; and

an current injecting circuit driven by an output voltage of said second differentiating circuit,

an output of the current injecting circuit being connected to the output of the DC-DC voltage converter circuit, and

an output of the current absorbing circuit being connected to the output of the voltage converter circuit.

8. (original) A DC stabilized power supply as claimed in claims 7, wherein said converter circuit outputs a control signal to said first differentiating circuit or said second

differentiating circuit to stop an operation of said first differentiating circuit or said second differentiating circuit, when said DC stabilized power supply is starting or stopping.

9. (original) A DC stabilized power supply as claimed in claim 7, wherein said converter circuit outputs a control signal to said current absorbing circuit to stop an operation of said current absorbing circuit, when said DC stabilized power supply is starting or stopping.

10. (original) A DC stabilized power supply as claimed in claim 7, wherein said converter circuit outputs a control signal to said current injecting circuit to stop an operation of said current injecting circuit, when said DC stabilized power supply is starting or stopping.